THE DISTRIBUTION AND HABITS OF THE BEE *HYLAEUS PECTORALIS* FÖRSTER, 1871, (HYMENOPTERA: APIDAE) IN BRITAIN

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R. C. L. Perkins (1900) described *Prosopis palustris* as a species new to science, which had been collected at Wicken Fen, Cambridgeshire, and in similar localities in Suffolk. Both this name and *Prosopis kriechbaumeri* Förster, 1871, are now regarded as junior synonyms of *Hylaeus pectoralis* Förster, 1871. For many years following its discovery in Britain, this small bee was found only in a number of wetland sites in East Anglia (particularly at Wicken Fen). There is also an unconfirmed record from Matley, New Forest, Hampshire, in August 1901 (Morley, 1903).

On 26.vii.1972 I collected both sexes of a *Hylaeus* in fenland adjacent to the River Alver at Browndown, near Lee-on-Solent, Hampshire, which I assumed were large individuals of *H. communis* Nylander. However, it soon became apparent that these were *H. pectoralis*. Further visits to the site in 1972, and in later years, demonstrated that it was well established in this locality. In subsequent years I also reared numerous specimens of the bee from nests, built in the galls of the chloropid fly *Lipara lucens* Meigen, collected in the same area. From 1973 onwards I searched for the species in other, similar wetland localities in the county and found a further 17 sites. Most of these localities are on the coast, but some are also inland (including Matley, corroborating Morley's old record). Searches by me in suitable localities in other counties produced records from Dorset, Essex, the Isle of Wight, Suffolk, and West Sussex. Further recent records by others are from Cambridgeshire, Norfolk, Suffolk, Surrey and West Sussex. In addition, there are pre-1970 records from Northamptonshire, Suffolk and north Norfolk. All records (for most of which there are voucher specimens in The Natural History Museum, London) are shown on the distribution map (Fig. 1).

H. pectoralis is a good example of an "Anglo-Dutch" or "Doggerland" species. Before Britain became separated from mainland Europe (c. 6000 years ago) it was joined to the Continent by a largely swampy land bridge, through which the Rhine flowed northwards. Some species of insects which occurred on the banks of the river are, in Britain, still mainly confined to south-east England. These "Doggerland" species also include the bee *Colletes halophilus* (Verhoeff) and the sphecid wasp *Mimumesa spooneri* (Richards) [sometimes cited as *Psen spooneri*] (Richards, 1964).

HABITAT, NESTING HABITS AND PARASITOIDS

H. pectoralis is associated with stands of the common reed, *Phragmites australis* (Cav.). Perkins (1900) described the bee as "burrowing in the dry stems of reeds". More recently J. P. Field (pers. comm.) reared a specimen from a bundle of cut, dead *Phragmites* stems suspended as "trap nests' from a pole within a reed bed. However, the majority of nests have been found in the vacated, spindle-shaped galls of *Lipara lucens*. These galls are located on the apices of the flower stems of the *Phragmites*, their development inhibiting flowering (Fig. 2). In a gall containing a larva of *L. lucens* the ensheathing leaves are tightly pressed together (forming a sharp apical point) and are green in colour. *L. lucens* overwinters within a puparium in the cavity which it created as a result of its larval feeding activity within the basal half of the gall (Fig. 3). By this time the gall has generally assumed a brown coloration, following the death of the leaf sheaths. The adult fly emerges in the early summer

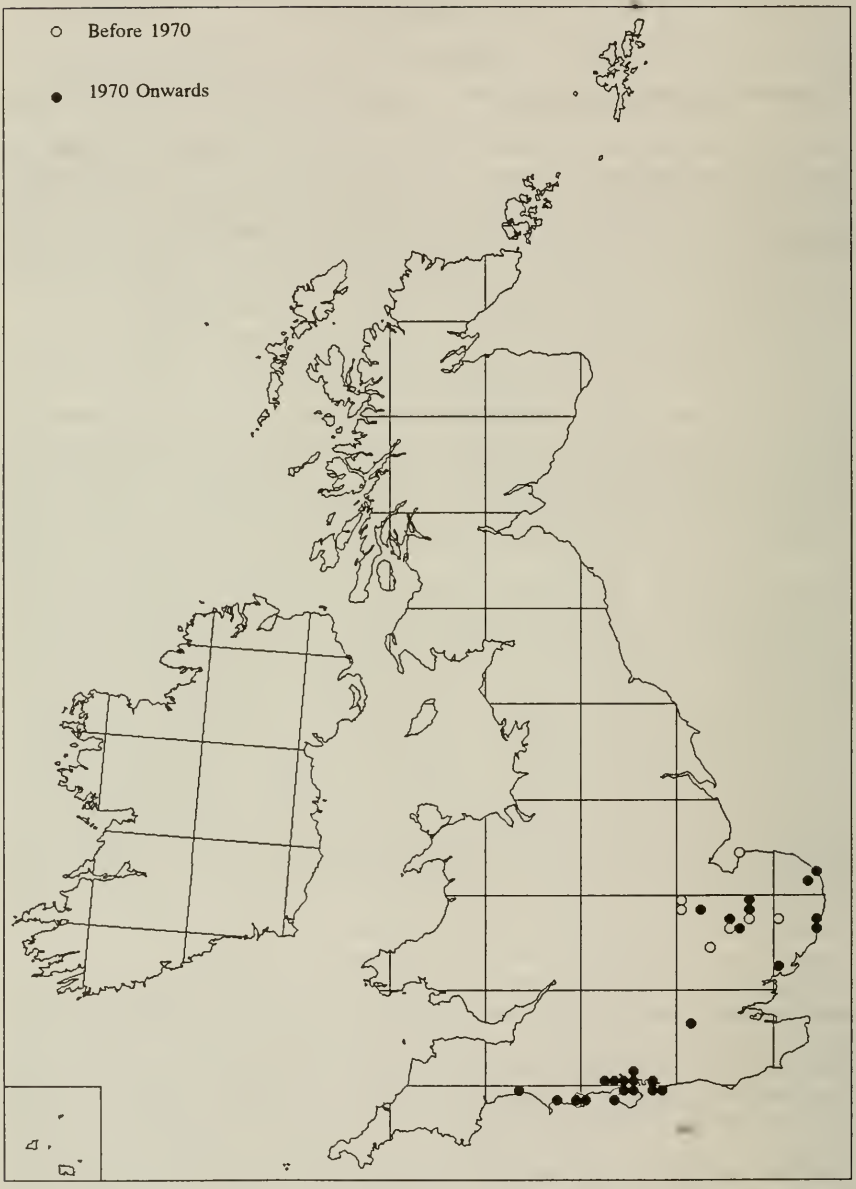

Fig. 1. British distribution of *H. pectoralis*.

Fig. 2. Old gall of *Lipara lucens* Meig. on *Phragmites australis* (Cav.) stem. Browndown, Hampshire (G. R. Else).

and it is only then that the gall becomes available for use as a nest site by the bee. Old galls, which may contain nests of this bee, can further be recognized by their frayed tips.

The female *H. pectoralis* apparently always removes the fly's empty puparium from the gall chamber, as this has never been found in one containing a nest (those without such a nest contain the eclosed puparium, unless the *L. lucens* larva was parasitized or eaten by a bird). The female bee builds its nest within the gall chamber, the cells sometimes extending into the apical leaf sheathing. The nest entrance is between the leaves which form the apex of the gall, and is generally not clearly visible. The galls of *L. lucens* vary considerably in size, and this dictates the number of cells each can contain, the usual range being from two to eight, as the cells are constructed as a linear series (Fig. 4). Those cells destined to contain female progeny are generally the first to be built (i.e. the cells furthest from the nest entrance), whereas males are found in those built nearest the nest entrance. In common with those of other British *Hylaeus*, cell linings are formed from a secretion of the female's salivary glands, the viscous liquid being spread on to the inner walls of the gall with the bee's short, bilobed glossa;

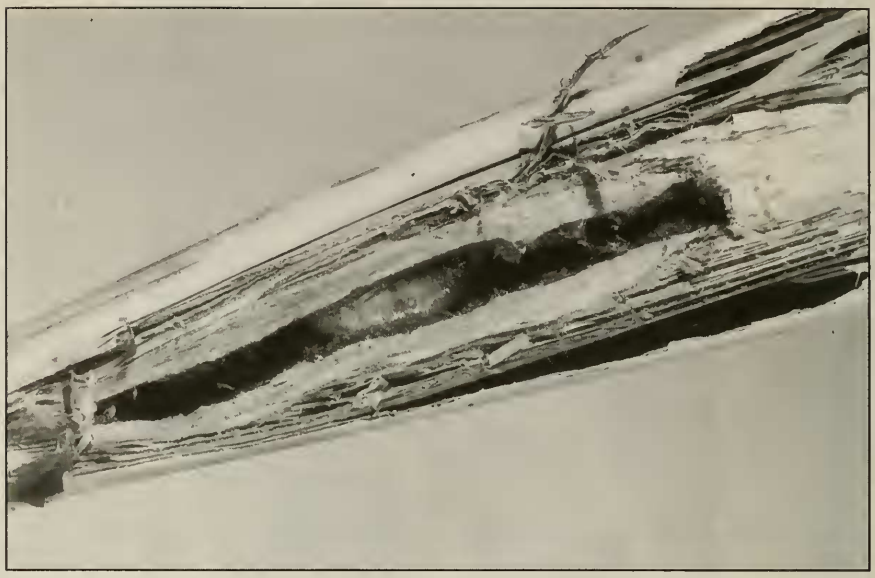

Fig. 3. Opened gall chamber of *L. lucens* gall with puparium of this species *in situ* (G. Dickson).

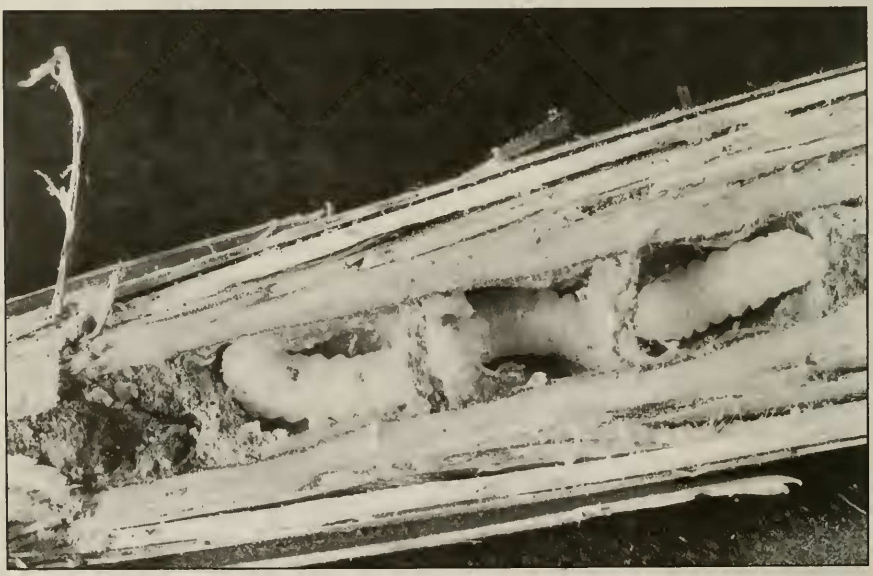

Fig. 4. Occupied cells of *Hylaeus pectoralis* Förster in gall of *L. lucens*. (G. Dickson).

the cell partitions are constructed in similar fashion. On drying, the secretion produces a thin, transparent, cellophane-like membrane which is impermeable to water (it also ensures the cells retain the semi-liquid pollen/nectar provision). British pollen sources are not known, but the species is probably polylectic (as in Germany (Westrich, 1989)). In Britain individual bees have been observed visiting bramble (*Rubus fruticosus* L., *sensu lato*), angelica (*Angelica* species), hogweed (*Heracleum sphondylium* L.), wild carrot (*Daucus carota* L.), hawkbit (*Leontodon* species) and field milk-thistle (*Sonchus arvensis* L.) flowers.

A provisioned nest is sealed with a substantial plug of compacted, finely shredded reed leaf fragments which often extends up into the leaf sheath of the gall. This plug immediately betrays the presence of a nest when a gall is opened by carefully tearing away the outer leaf sheathing. *H. pectoralis* overwinters as a prepupa within its cell; the larva does not spin a cocoon. A photograph of an opened nest also appears in Imms (1971).

I have reared both the evanioid wasps *Gasteruption assectator* (L.) and *G. jaculator* (L.) from nests of this bee. No other parasitoids seem to have been recorded.

Acknowledgements

I am most grateful to M. Edwards and S. Falk for their records of this species, and to S. P. M. Roberts for preparing the distribution map of *Hylaeus pectoralis* (drawn on DMAP). G. Dickson kindly permitted the use of his photographs (Figs 3 and 4) to illustrate this paper.

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BOOK REVIEWS

The butterflies' fly-past by Clive Simson. Leeds, Peregrine Books, 27 Hunger Hills Avenue, Horsforth, Leeds LS18 5JS, 1994, xviii + 127 pages, £19 (post free), hardback. —'This book is in no way a textbook'. So begins, and ends, the author's first sentence, and for this much we should be forever thankful. Were it otherwise, what gems from many an entomological encounter, what field-notes from past years and what other pleasures we should have missed. These, together with carefully detailed observations from the wider field of natural history, liberally populate this unusual book—and all is achieved without the aid of a single dot-distribution map.

But I have jumped the gun, for the stage is set by a foreword written in forthright style by Wilson Stephens, Editor of *The Field* from 1951 to 1977. Here, one or two sacred cows are, of necessity, put to slaughter, but in a well reasoned, open and totally honest fashion, a manner which is matched by each page of the ensuing fly-past.

The author admits to having chosen unusual chapter headings. What, I wonder, will the reader make of 'Big Fritz and little Fritz', 'Purple is for Caesar', 'A brown study', 'Putting on the Ritz', 'Birth of the blues', 'Streaking', 'Buddleia bugs', 'All white' and 'Skip for joy'?. All these, in the author's inimitable style, relate to groupings of the